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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •

FEBRUARY 4, 1933

On a Palace Stair

See Page 68

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The Weekly Summary of Current Science

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Edited by WATSON DAVIS

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DO YOU KNOW?

Doctors find some evidence that cataract may be inherited.

British aviators have succeeded in flying over Mount Rakaposhi in the Himalayas, a peak 25,550 feet high.

Europe's largest automobile plant is a new Russian venture, near the town of Maxim Gorki, on the Oka River.

Since cranberries can be raised in both Nova Scotia and New Brunswick, Canada is setting out to raise the supply of cranberries formerly imported from the United States.

A professor at the Hebrew University in Jerusalem has made the first translation of Aristotle's "Metaphysics" from Greek into Hebrew.

Egyptians of 4,000 years ago were, so far as is known, the first people to transplant trees with a ball of earth, sometimes carrying them 1,500 miles by boat.

Lake Ohred in central Europe is an old, isolated body of water which has sheltered and kept in existence many forms of animal life that have long been extinct in other waters of Europe.

Pharmacists' records show that the first store dealing exclusively in drugs was opened in Wetzlar, Germany, in 1233.

America's exports in 1932 provided at least 2,000,000 American workers with employment, says a Department of Commerce statement.

Hunters have killed off so many of the picturesque spoonbills of Florida, for both food and feathers, that less than 1,000 of these birds are left there.

A new electric iron is fitted with an indicator which shows the temperature of the iron and indicates the proper heat for ironing different materials.

"Dogs of war" were no mere figure of speech in ancient time, for the Assyrians and other nations used dogs in the fighting, and often dog fought against dog when armies met.

As evidence that Vancouver Island was cut off from Canada a very long time ago, scientists point out that 15 of the 17 land mammals there are distinct species or sub-species not occurring elsewhere.

WITH THE SCIENCES THIS WEEK

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MEDICINE

Two Drugs Found Which Cure Horrible Disease of Weakness

Bedridden Woman Medical Student Discovers Value of Ephedrine in Effort to Cure Herself

NEW STRENGTH and health for victims of a horrible disease of killing weakness has been found in two drugs, ephedrine and glycine.

The discovery of ephedrine as a cure for the disease was made by Dr. Harriet Edgeworth of Chicago, who was herself attacked by it while a student in medical school. Members of the staff of the Mayo Clinic, who have been using both medicines successfully in treating the ailment, heard Dr. Edgeworth tell her own story.

Three years ago Dr. Edgeworth was bedridden, entirely helpless, dependent on the constant aid of nurses, scarcely able to swallow. Then she discovered, accidentally, that ephedrine gave her renewed strength. Daily doses of six-eighths of a grain of this drug, familiar to hayfever and asthma sufferers, now enables her to "live a life of some usefulness which is comparatively comfortable and pleasant."

"I am dependent on a maid only for dressing, bathing and combing my hair," she told the physicians. "I work about the house, sew, read, write at will, and can get into and out of a car with a little help."

The discovery of the value of ephedrine in her case was dramatic. For over five years she had suffered from the disease, gradually getting weaker and weaker. Different treatments were constantly tried by her physicians.

Disagrees With Physician

One of these, a serum treatment, caused a severe reaction. To help her recover from the effects of the serum, ephedrine and epinephrine were given her. She noted a return of strength almost immediately. Within two days she was able, for the first time in months, to sit up in a chair and to eat solid food. While she suspected the ephedrine, her physician ascribed her improvement to the serum treatment.

When she stopped taking the ephedrine, she relapsed to her former state. More serum treatments did not help. Then she insisted on trying the ephedrine again, and from repeated trials, she found that it really did help her.

The ailment from which she suffered is known by the Latin name of *Myasthenia gravis*. It is fortunately not very common. The patient first notices that he is getting very tired. He sees double. Then his jaw muscles become too weak to chew and before long he is so weak he cannot turn over in bed. No cause has been found for the disease.

Knowledge From Germany

At about the time Dr. Edgeworth was discovering the value of ephedrine in treating her own case of this disease, physicians on the staff of the Mayo Clinic learned from a German scientist, Prof. Karl Thomas of the University of Leipzig, Germany, that glycine, a constituent of many proteins, was useful in treating a similar condition in children in which the muscles waste away. There is, curiously enough, no wasting of the muscles in *Myasthenia gravis*. While they did not find the new drug very helpful to the children, the Mayo Clinic physicians decided to try it in cases of *Myasthenia gravis*. These patients were greatly helped by glycine. When Dr. Edgeworth reported her use of ephedrine, the Mayo Clinic patients were given that drug in addition to glycine, with additional improvement.

Investigations are now under way to discover what are the best doses of the two drugs; whether or not they may be used to diagnose cases in the early puzzling stages of the disease; and how they act to overcome the disease. From this may come knowledge of what causes the condition. The members of the Mayo Clinic staff engaged in these studies are: Drs. W. M. Boothby, Mildred Adams, M. H. Power, F. P. Moersch, H. W. Woltman, and R. M. Wilder.

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GEOLOGY

Waterfall Restored With Photograph and Paints

RESTORATIONS of long-extinct animal species are often made by skilled artist-paleontologists, who cause flesh and skin to reappear on stony fossil bones, with all the assurance of the Vision of Ezekiel. But it has remained for an artist-photographer of Portland, Asahel Curtis, to restore the living water that once thundered over the cliffs of the Grand Coulee in Oregon, making it earth's mightiest cataract, dwarfing Niagara a dozen times over. (*SNL, Aug.* 13, '32, *p.* 95). He simply photographed the dry cliffs as they stand, and then painted in the long-vanished curtains of plunging water.

The combined painting-photograph is reproduced herewith.

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EARTH'S MIGHTIEST WATERFALL RESURRECTED

ENGINEERING

Radical Changes Suggested For Modern Automobile

Safer Cars, Lighter in Weight, More Economical and More Comfortable for Occupants, Declared Possible

SCATHING criticism was hurled against the modern automobile before the American Society of Automotive Engineers meeting in Detroit by Herbert Chase, consulting engineer of New York.

Automobiles are now too rough riding, too low-down, too heavy, too dangerous and numerous other "too's," in the opinion of Mr. Chase. Many needed improvements, he says, can be made almost immediately without time-consuming research. Mr. Chase lamented the fact that this is not done because engineers "are bound by conventions and inhibitions which require them to make the least possible change that will enable their company to get through another season with satisfactory sales."

The "low-down" accusation combines with it the charge that cowlings are too high. Cowlings of present design were said to be dangerous because they do not enable the operator to see enough of the road immediately in front of the car, and tiring because he has to strain his neck to see. Mr. Chase believes that very low cars do not achieve the safety claimed for their low centers of gravity. Too low a center tends to increase skidding and reduce the pressure of the outer tires against the road when rounding a curve, which results in instability, he said. This instability was called a worse hazard than high center of gravity.

The militant engineer recommended three-point chassis suspension as the solution to the rough-riding problem. He said that the finest riding car he ever drove was so constructed.

"In addition to increased comfort," declared Mr. Chase, "many steering difficulties are overcome. There is no shimmy; and tramp, if it occurs, has no perceptible effect upon the chassis. Moreover, chassis and body are relieved of twisting strains, and the whole car can be made considerably lighter. . . . . I am confident that highly unstable doughnut tires, as they exist today, and 12-inch upholstery will prove quite unnecessary to give a superlative ride even on rough roads once a really good suspension for the chassis is developed."

The bulk of the present-day car and its inefficient utilization were bemoaned.

"Scarcely 40 per cent. of the area a car occupies is devoted to useful load-carrying space," Mr. Chase declared. "The remainder, or about 60 per cent., including bonnet, cowl, fenders and running boards, a useless space between the spring horns and often as much or more space back of the rear seat, is a total loss so far as carrying useful load is concerned. This arrangement is not logical and not good economy. I do not contend that all the waste space can be converted into useful load-carrying purposes, but I am sure that a much larger proportion of it can be and ought to be so converted, and the total size of the vehicle materially decreased.

"If this were done cars would be far less bulky, less unwieldy, easier to maneuver, lighter, and considerably less expensive."

From the remaining suggestions these summaries were made:

To help get true streamlining, eliminate fenders, stow engine below decks or in rear, recess wheels, and fair headlights into body.

Use improved two-stroke cycle engine to get more power for given weight and high economy at light loads.

Simplify driving with automatic choke and heat controls and one pedal gearshift.

Substitute heat- and noise-insulating synthetic materials for steel and glass in the body.

For the short-legged driver, adjustable seats that rise when moved forward.

Seat backs that move up and down with the passenger instead of polishing his back. (Will not be needed in the improved three-point suspension car.)

Elimination of or padding of top bows over passengers' heads.

Narrower pillars and larger rear windows for better vision.

Slope windshield and window glasses to reduce reflection.

Do not put a radio in the car because it distracts the driver.

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ARCHAEOLOGY

Superlative Splendor Revealed By Excavations in Persia

See Front Cover

EASTERN magnificence which surrounded Persian emperors 2,500 years ago is revealed by excavations at Persepolis. Palaces of the kings are being brought to light there, by Dr. Ernest Herzfeld excavating for the Oriental Institute of the University of Chicago. The sculptured walls arouse comparisons with glories of one of the world's most famous palaces, Versailles.

Dr. James H. Breasted, director of the Oriental Institute, says of this sculpture: "There has never been any discovery like it anywhere in Western Asia since archaeological excavations began there almost a century ago."

A stairway, uncovered by the excavators, is carved with a scene of pomp and ceremony. Up the stair rises a long line of ambassadors from 22 subject nations, bearing tribute to Persia. Down the stair, on the opposite side are ranged the brilliantly uniformed palace guards. The cover of the SCIENCE NEWS LETTER presents a close view of two tribute bearers.

So beautiful is the finish of the sculptors' work that even chariot nails are ornamented. Copying bronze originals, the sculptors carved nail heads into female figures, achieving delicacy of cameo in stone work no larger than a postage stamp.

Colors once added to the splendor of the scenes, but none is left except on a portrait of the Emperor, showing him in a robe bordered with scarlet and purple, scarlet shoes, and other spectacular finery. Tradition says that the palaces were sent up in flames by Alexander the Great in 330 B.C. as a climax to a drunken feast.

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STILL BEARING TRIBUTE

POPULATION

World Population Quadrupled Within Three Centuries

Fact That European Stocks Increased More Than Six Times Faster Than Others is Among Revelations of New Study

IN LESS THAN three centuries the population of the earth has nearly quadrupled. Up to 1900 the rate of increase was accelerating, but since the turn of the century the rate of increase slackened although of course there are millions more on earth now than there were in 1900.

The best estimate of the earth's population is 1,820,000,000 as of 1929. Dr. Walter F. Willcox, Cornell's professor of economics and statistics, arrives at this figure after an extensive study of earth population, past and present, reported in an extensive research into international migrations just published under his editorship by the National Bureau of Economic Research.

Half of World in Asia

Asia, with the teeming hordes of China, is the most populated continent, with 954,000,000, or over half of the earth's inhabitants. Incidentally even for the present time it is most difficult to fix a reliable figure for China's population, due to the lack of census data and the turmoil of the Orient.

Europe has 478,000,000 persons on 3,800,000 square miles and is the most densely populated continent. Asia's population lives on a continent of 16,700,000 square miles.

North America, with a population of 162,000,000, outranks Africa's 140,000,000, although it is slightly smaller in area. South America has 77,000,000, and Australia and Polynesia together are credited with 9,000,000.

About the population of the earth before the seventeenth century saw the dawn of the modern scientific period, there is little information. Dr. Willcox's estimates begin with one for 1650. The difficulty of the task is shown by the attempts that were made in the seventeenth century by five writers. They ranged from 320,000,000 to 1,000,000,000. The figure arrived at by Dr. Willcox is 465,000,000.

Human beings increased to 660,000,000 in number in 1750; 836,000,000 in 1800; 1,098,000,000 in 1850 and 1,551,000,000 in 1900. In the last third of a century the increase in world population has been about equal to twice the total population of the United States. The rise of the white race is shown in the figures assembled by Dr. Willcox. European stocks have increased about 6.4 times since 1650 or about twice as fast as the non-European stocks. Of today's 642,000,000 persons of unmixed European stock, 164,000,000 live outside Europe, nearly one and two-thirds as many as there were in Europe in 1650.

Another interesting finding by Dr. Willcox is that there is now more American Indian blood in the Western Hemisphere than there was in 1650 when 13,000,000, practically all Indians, lived in the New World. One estimate is that the present number is 26,000,000, of whom two-fifths are in Mexico.

People and Food

One of the enigmas in the world population figures is what caused Asia in the century before 1750 to increase in population at a rate twice that of Europe at the same time. Since 1750, on the contrary, Europe's rate of growth has been more than twice that of Asia. It appears that when and where the production of food or other economic goods has increased, population also has increased and often the standard of economic life has risen. Dr. Willcox has been unable to find evidence for an increase in food in Asia between 1650 and 1750 and he feels that the early figures for Asia and even the present figures are open to change.

So difficult is it to determine China's population at the present time that differences of 100,000,000 in estimates have been common. This is nearly equivalent to leaving out or counting twice the population of the U.S.A. in making world estimates. The figure adopted by Dr. Willcox for China's post-world-war population is 342,00,000, while the League of Nations 1929 estimate is 458,000,000.

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PHYSICS

Three Million Volts Hurled By New Compact Machine

A NEW compact electrical impulse generating hurling 3,000,000 volts is reported to *Nature* from the Metropolitan Vickers Laboratory, Manchester.

The new high voltage machine is only five feet diameter and ten feet high. It contains parallel charged oil-impregnated condensers with all spark gaps segregated in an air column with the air under high pressure. It thus combines the advantages of both air and oil gaps.

The engineers who constructed the new generator were: T. E. Allibone, F. S. Edwards and D. B. MacKenzie.

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ASTRONOMY

February Evening Skies

Eclipse of Sun, Return of Planets, Conjunctions And Display of Bright Stars Feature Celestial Show

By JAMES STOKLEY

IN RECENT months the evening sky has been devoid of planets, but February brings two bright planets along with its unusually magnificent display of stars. During coming months they will become more and more conspicuous and will be joined by their brethren of the solar system.

Jupiter and Mars are the planets now visible. They appear rather low in the east and their brilliance makes them easy to locate. Jupiter is the brighter and the lower of the pair. Mars is distinctly reddish in color and just now it is approaching closer to us than it has been for several years. At the beginning of the month it is 71,884,000 miles away while on February 28 it will be at the neighborly distance of 62,828,000 miles. The following few days it will approach about a hundred thousand miles closer and will be at its nearest position, for this season, on March 3 when it will be only 62,717,000 miles from the earth.

Because of this comparatively close approach of Mars, always an object of interest, a number of great telescopes are now trained on it nightly, making photographs and permitting the observers at the other ends of these instruments to see and record the minute and fleeting details which even the sensitive photographic plate cannot retain. Chief of these observatories is the one at Flagstaff, Arizona, founded by the late Percival Lowell, leading authority on Mars. As a result of these studies it is fully to be expected that a little more light will be shed on such puzzles as the strange markings on the planet called "canals."

The other planetary decoration of the February evening sky is considerably farther from us, even though it is brighter. At the middle of the month Jupiter is 416,156,000 miles distant. But it is so large, 86,728 miles in diameter as compared with 4,216 miles for Mars and 7,918 for the earth, that it picks up considerably more of the sun's light to reflect to us. Jupiter, like Mars, the earth and all other planets, shines by reflected sunlight, not by its own glow.

Late hours will be required if you wish to see any of the other naked eye planets this month. At no time will Mercury, nearest of all the planets to the sun, be visible, but Venus, the next in order, can be seen low in the southeast just before sunrise, far brighter than any other star or planet in the vicinity. Near by will be seen Saturn, much fainter, though a very bright object. At the beginning of the month Venus will be to the west of Saturn, but after the fourteenth, it will be to the east. At 4:00 p. m., Eastern Standard Time, on February 14, the two will be closest. Then Venus will pass its more distant brother and they will be approximately a third the apparent diameter of the moon apart.

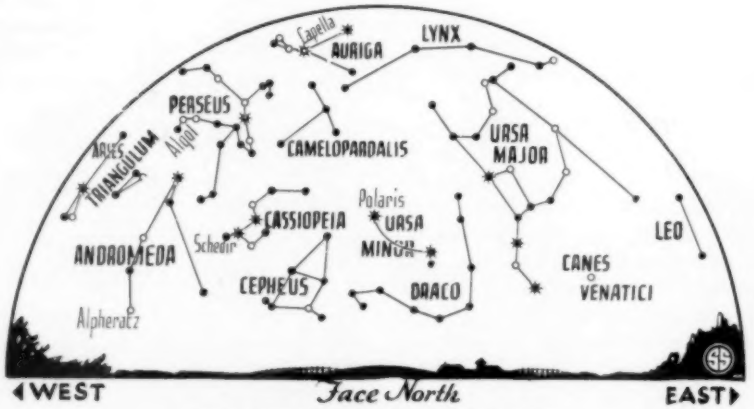
Planetary Conjunction

Unfortunately this closest approach, called the "conjunction," occurs during daylight hours in the United States, and in the eastern part of the country it happens even after the planets themselves have set. But just before sunrise on February 14 and 15 the two planets will be seen in the morning twilight, forming a beautiful pair. On the twenty-third is a conjunction of the moon with Venus under somewhat similar conditions and then the moon will be but a little more than its own diameter south of the planet. A more easily observable conjunction will happen on the twelfth when the moon, a few days past full, will pass near Mars. But this approach will not be particularly close.

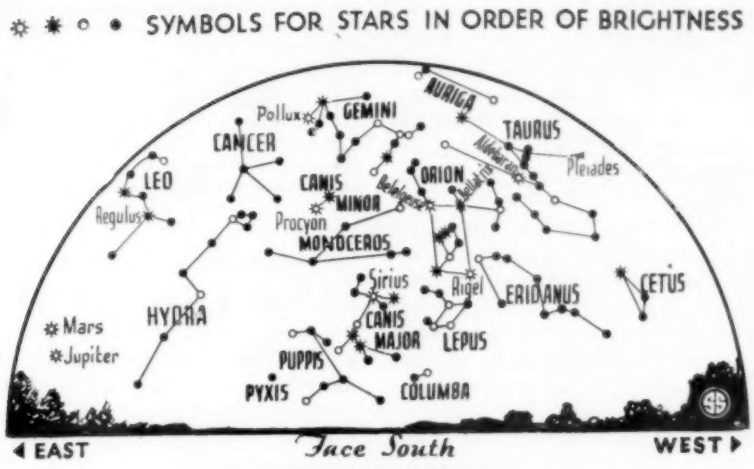
The year's first eclipse will come February 24, but will not be seen from any part of North America. It is an annular eclipse of the sun. As it will appear from points along a path passing Chile, Argentina, the south Atlantic Ocean, Central Africa, Belgian Congo, the Sudan, Ethiopia and Arabia, the moon will come directly in front of the sun. But at that time the moon will be far enough away so that its apparent diameter will not be quite as large as that of the sun and, even when it is right in front of that body, a ring of sunlight will still be visible. On account of the brightness of this ring, or "annulus," none of the phenomena attendant upon a total eclipse like that seen in New England last summer will be visible. Such an annular eclipse is of slight scientific value.

The moon will be new on February 24, for only at this phase can a solar eclipse occur. First quarter will come on the second, full moon on the tenth and last quarter on the seventeenth. This means that the first two weeks of the month will have moonlit evenings.

During February there is a magnificent display of first magnitude stars. Six of them mark the corners of a rough hexagon with a seventh at the center. Directly south about nine o'clock is Sirius, the dog star, in the constellation



NORTHERN HALF OF THE SKY



MARS AND JUPITER

The more distant body is the brighter.

of Canis Major, brightest of all the stars in the sky. Passing toward the west you come next to Rigel in Orion. Above and farther west is Aldebaran in the bull, Taurus, conspicuous for its ruddy color. Now go upward until almost directly overhead you see Capella marking the group of Auriga, the charioteer. Looking downward to the southeast you next reach Pollux, the brighter of the twins, Gemini. Below it you see the lesser dog star, Procyon, in Canis Minor and thus complete the hexagon. The one in the middle of this ring of stars is Betelgeuse, the upper of the first magnitude stars in Orion. Between it and Rigel is a row of three stars that forms the warrior's belt. Near Betelgeuse is another bright star, though not quite of the first magnitude, namely, Bellatrix, which is also in Orion. Still an eighth first magnitude star is to be seen, however. This is Regulus in Leo, almost directly east. Regulus marks the end of the handle of the sickle, a group almost as familiar as the great dipper.

Meteors Did Not Shower

This is the part of the sky that was anxiously watched by astronomers a few months ago when it was hoped that a brilliant shower of meteors would emerge from it. The sickle curves upward from Regulus and the center of the blade is the radiant, the point from which the so-called Leonid meteors seem to emerge. On the night of November 15, 1932, when this constellation did not rise until about midnight, a few meteors, or shooting stars, were seen to radiate from it. Nothing like the famous showers of the past when the whole sky was covered with these flashing lines of light, hundreds at a time, was seen.

Possibly November, 1933, may bring such a shower, and again it may not, for meteors are notoriously uncertain bodies. A few can be seen during February radiating chiefly from the constellation of Auriga, which is marked by the star Capella. The greatest display occurs about February 10, but this is a far less conspicuous shower than the Leonids, or the Perseids, which appear in August. And with the moon full the same night the meteor shower is expected to be at a maximum, few of the shooting stars should be visible.

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BOTANY

Plants More Active Than Corals in Making Islands

THE "little coral workers" celebrated in the old-time moralistic nursery verses have been getting more credit than they deserve as builders of islands. So it would appear, at least, from data offered by Dr. Marshall A. Howe, assistant director of the New York Botanical Garden.

Plants, not coral animals, do the lion's share of the work in building up so-called coral islands and atolls, Dr. Howe indicated. He cited one detailed study made on a South Sea island, where two kinds of lime-secreting seaweed occupied first and second places, respectively, as limestone builders, with third place going to a group of one-celled animals known as the foraminifera, and the corals coming in fourth. He backed this up with similar observation elsewhere, including a semi-enforced study of the richness of lime-secreting bottom vegetation made by himself once when becalmed for two days out of sight of land, in a small boat on the Bahama Banks.

Dr. Howe did not deny the claims of the coral animals to a considerable part in reef and island formation. But in the formation of many, if not most, of the so-called coral reefs or islands, lime-secreting plants—the algae—have contributed more than have the corals.

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METEOROLOGY-RADIO

Thunderstorms Located By Radio and Oscillograph

THE POSITIONS of all the large thunderstorms which occur over Europe and the North Atlantic can now be determined by radio apparatus in the British Isles, independently of weather reports. This was announced by R. A. Watson Watt, superintendent of the Radio Research Station of the British Department of Scientific and Industrial Research.

Atmospherics produced by the thunderstorms are so exactly analyzed by cathode ray oscillographs that with two radio stations working in cooperation it is possible to calculate trigonometrically the positions of the storms to within about a hundred miles. The two stations used are the Radio Research Station, near London, and the Leuchars Aerodrome station, in Fifeshire, Scotland. These stations are about four hundred miles apart, and they enable thunderstorms to be located within a radius of 3,000 miles. Sometimes hundreds of storms are detected within a minute.

Mr. Watson Watt stated that this system has so far been used by Britain alone of the European countries, but that the American Navy is experimenting with it.

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PHYSICS

Abbé Lemaitre Extends Uncertainty Theory

ABBÉ Georges Lemaitre, the Belgian priest-professor of the University of Louvain, now visiting this country, has extended the uncertainty theory of physicis to the electrical field of a particle.

Prof. W. Heisenberg, the German physicist, by developing his uncertainty principle, which held that it was impossible to know accurately the place and speed of an object at the same instant, introduced a concept of wide philosophical consequences.

Now in a letter to the *Physical Review*, Abbé Lemaitre develops formulae which allow him to conclude that for instantaneous determinations the electromagnetic field of an electron, proton or atomic nucleus is practically undetermined. To know the instantaneous field of such a fundamental particle of matter to within one part in a hundred, Prof. Lemaitre computes that its charge must be at least 60,000,000 times the fundamental charge on the electron which physicists designate as small letter e. This is a relatively large quantity although it is small when translated into volts.

The atom as originally visualized by Prof. Neils Bohr, the Danish physicist, was considered by Prof. Lemaitre in the light of these new computations of the uncertainty principle.

"Bohr was right," Prof. Lemaitre said, "when he considered the field of the atomic nucleus as determining the orbit of the electron, since this field is static and remains significant when averages are taken over long periods of time. He was also right in neglecting the radiation of the moving electron, because we see now from the uncertainty principle that the only determined field is the average field during a time in which the electron has made more than 10,000,000,000 revolutions."

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SEISMOLOGY

Ocean Bottom Shaken Near Madagascar

THE BOTTOM of the Indian Ocean southeast of Madagascar was shaken by a severe earthquake late on the afternoon of Saturday, Jan. 21, reports from a number of seismological stations indicate. Scientists of the U. S. Coast and Geodetic Survey located the epicenter at approximately thirty-three degrees south latitude, fifty-nine degrees east longitude. Time of origin of the quake was 2:20.8 p. m., eastern standard time.

The Pacific ocean floor almost directly north of Samoa was disturbed by an earthquake on the night of Friday, Jan. 27. Scientists of the Jesuit Seismological Association, St. Louis, working on data gathered telegraphically by Science Service, made calculations showing that its epicenter was in latitude nine and one-half degrees south, longitude one hundred seventy-three degrees west. Time of origin was 10:36 p. m., eastern standard time.

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PUBLIC HEALTH

Medical Guilds Proposed To Balance Costs Care

HOW WOULD you like to pay $50 or $60 every year to a medical guild which would in return take complete care of your health, whether you were sick or well during the year?

This is the possibility seen by sponsors of a new plan for balancing the costs of medical care. The plan, calling for the establishment of medical guilds, is announced by Evans Clark, director of the Twentieth Century Fund, in a book published recently. The Twentieth Century Fund was one of the backers of the Committee on the Costs of Medical Care which recently disbanded.

By the guild plan, as Mr. Evans outlines it, individual members would pay $50 or $60 every year, sick or well. In return they would have the benefit of annual health examinations, dental care, the attention of physicians and nurses, and the use of hospitals and clinical laboratories whenever needed. Membership in the guild at this figure probably would not include care in cases of tuberculosis or mental disease, which require long periods in hospitals.

Sponsors of the plan point out that each guild member would be able to include a fixed sum in his budget for illness, just as he now does for other items; that at the same time each physician of the guild would have a fixed adequate income and would be relieved of the burden of adjusting fees and making collections.

Preventive medicine is favored under the guild plan, Mr. Evans says, because periodic medical examinations, said to prevent illness to a marked degree, would be included.

Science News Letter, February 4, 1933

IN SCIEN

PHYSICS

Lithium Atoms Smashed By Low-Voltage Missiles

LITHIUM atoms have been disintegrated by bombardment with streams of protons or positive electrical particles at relatively low voltage, by three German physicists at the Institute for Experimental Physics at Kiel.

The three researchers, Dr. H. Rausch von Traubenberg, A. Eckardt and R. Gebauer, sought the threshold, or point of lowest electrical energy, at which the atom-breaking phenomenon would take place. When first performed last year by Drs. J. D. Cockcroft and E. T. S. Walton at Cambridge University, the energy used amounted to 600,000 volts. With a specially constructed apparatus the workers at Kiel obtained definitely detectable atomic breakdowns with an input of only 29,000 volts, less than a twentieth of the energy used in the English experiments.

The work of the three German physicists is summarized in a report to *Die Naturwissenschaften*.

Science News Letter, February 4, 1933

MEDICINE

Mystery of Fatal Peruvian Disease Solved

THE MYSTERY that for 40 years has surrounded the highly fatal Peruvian disease known as Oroya fever is finally being penetrated, it appears from a report in the *Journal of the American Medical Association*.

Dr. Ramón E. Ribeyro, professor at the National University of San Marcos of Lima, Peru, has finally shown that the outlook in this disease is good unless it is complicated by infection with an organism known as paratyphoid B bacillus. It is this complication which is responsible for the deaths that occur in cases of Oroya fever.

The mystery of this disease, comments the *Journal*, has taxed the ingenuity of numerous workers since Daniel A. Carrion in 1885 sacrificed his life to prove the identity of verruca peruana and Oroya fever.

Science News Letter, February 4, 1933

NE FIELDS

ENTOMOLOGY

Mosquito Horde Attacks And Kills Livestock

A FURIOUS attack by a mosquito horde near Miami, Fla., resulted in the death of at least 173 head of livestock and poultry, F. C. Bishopp of the U. S. Department of Agriculture has reported to *Science*.

While blood loss was an important factor, Mr. Bishopp is of the opinion that the death may have been due to the injection of a toxin by the mosquitoes as well as to loss of blood. He points out that few of the current reports of fatal attacks on man and animals by mosquitoes have been verified. The check of the losses in this instance was made by T. E. McNeel of the U. S. Bureau of Entomology.

Science News Letter, February 4, 1933

ENGINEERING

1000 Degree Steam Predicted for Power Plants

CONCENTRATED energy, bottled up at a temperature nearly five times that of boiling water and a pressure of 1,400 pounds or more per square inch, was predicted to the American Institute of Electrical Engineers by Melvin D. Engle and Irving E. Moultrop, engineers with the Edison Electric Illuminating Co., Boston.

The bottle will be the steam boiler of the future, made with stronger alloys than are available today and containing so much steam that it will be able to operate efficiently enough to reduce the cost of generating electricity.

"Most of the problems involved in the use of a steam temperature of 750 degrees Fahrenheit have been solved," the engineers explained. "Some of the new stations now being built will operate at temperatures of from 825 to 850 degrees Fahrenheit, and within a comparatively few years plants undoubtedly will be operating with steam temperatures of 1,000 degrees Fahrenheit.

"Since the limitations imposed by the materials used in the construction of superheaters, reheaters, turbines, valves, and other such equipment slowly are being removed and the 1,000 degree Fahrenheit station no longer is a fantastic dream; it will be a reality within the life time of many of those living today."

A pressure of 1,400 pounds per square inch has already been reached in a few installations and several large plants to operate at nearly this pressure are under construction. It was pointed out that the development of apparatus using these unusually high pressures has been very rapid.

Science News Letter, February 4, 1933

GEOLOGY

Meteor Crater Possibly 40,000 to 75,000 Years Old

METEOR CRATER, the great pit in the northern Arizona plateau believed to have been caused by the smashing impact of a massive projectile from the skies, may be much older than it is commonly credited with being. Past estimates have ranged from 2,000 to 10,000 years, but on the basis of five independent lines of geological evidence Prof. Eliot Blackwelder of Stanford University is "led to suspect," he states, "that the crater was made during the last interglacial epoch, perhaps 40,000 to 75,000 years ago."

Most of Prof. Blackwelder's evidence consists of indications of a much moister climate than now prevails on the arid plateau, and of a relatively long duration of this moist climate. Most striking is his interpretation of a deep deposit of lake-bed strata at the bottom of the crater. This deposit is of such a nature that it indicates a long-standing, permanent body of water, not a mere succession of playas or seasonal ponds such as might be found in the Southwest of today. At present one must bore 200 feet below the bottom of the pit to find permanent water.

The old lake-bed deposits consist of extremely finely pulverized quartz with many remains of snail-shells and diatoms, or one-celled water plants. This is interbedded with fresh-water limestone, beds of coaly material, and a single layer of volcanic ash, indicating a long-past explosive eruption somewhere in the neighborhood.

Prof. Blackwelder's other lines of evidence consist of marked indications of active erosion by the wind and also by running water, such as is furnished by the infrequent "cloudbursts" of a semi-arid region.

Science News Letter, February 4, 1933

BOTANY

Hybrids Not Always Bigger Than Parents

HYBRID plants are not always bigger and stronger than their parents in every respect, but the size-increasing effects of crossing are shown in some hereditary characters and not in others. Indications to this effect, contrary to prevailing assumptions about "hybrid vigor," have been found in a study of oat hybrids by F. A. Coffman of the U. S. Department of Agriculture, and are published in a preliminary note in *Science*.

Mr. Coffman bred two different lines of hybrid oats, which is incidentally a difficult plant to hybridize. In one line he found that the first hybrid generation was taller, had more stalks per plant, weighed half again as much and yielded a third again as much grain, than the larger of its two parent plants. But in other respect it did not excel both its parents, as by the assumptions of "hybrid vigor" it should; it was merely intermediate between them. The second cross likewise excelled its parents in some characters, but was intermediate between them in others.

Other hybrid oats, not described in detail, are mentioned as having shown "hybrid vigor" in certain characters.

Science News Letter, February 4, 1933

PHYSICS

Unlike Neutrons May Save Conservation Law

THAT ALL neutrons do not have the same mass or weight is predicted by Dr. A. v. Grosse of the Kent Chemical Laboratory, University of Chicago, in a communication to the *Physical Review*.

Electrons or beta rays given off from a disintegrating atomic heart do not always have the same energies. This has worried physicists so much that some have suggested that the principle of conservation of energy be abandoned in considering the emission or capture of electrons in the atomic nucleus. Dr. Grosse suggests instead that the masses of all neutrons are not identical but vary according to the energies of the beta rays that are actually observed.

The neutron was the atomic building block, similar to the proton or hydrogen atom heart except for its eceltrical neutrality, which was discovered by Dr. J. Chadwick at Cambridge, England.

Science News Letter, February 4, 1933

ASTRONOMY

Dark Nebulae

"A Classic of Science"

Strange Dark Shapes Against the Background of Stars Appear to be Nebulae of Dead, Non-luminous Matter

ON THE DARK MARKINGS OF THE SKY with a Catalogue of 182 *such Objects. By E. E. Barnard. In The Astrophysical Journal, vol. XLIX, No.* 1, *Chicago,* 1919. *This is an exact reprint of extracts from the original publication.*

IT WOULD be unwise to assume that all the dark places shown on photographs of the sky are due to intervening opaque masses between us and the stars. In a considerable number of cases no other explanation seems possible, but some of them are doubtless only vacancies.

I do not think it necessary to urge the fact that there are obscuring masses of matter in space. This has been quite definitely proved in my former papers on this subject. If any doubt remains of this it will perhaps be readily dispelled by a close examination of the photographs previously printed. The conclusive ones I think are:

1. The photograph of the nebula about Nu Scorpii which clearly shows partial and complete obscuration by the great wing-like nebula that covers much of the immediate region of Nu Scorpii and extends southward to the great nebula of Rho Ophiuchi.

2. The region of Rho Ophiuchi, where a large space of sky is blotted out by a great and beautiful nebula. The fact of obscuration is clearly evident here, for wherever a trace of the nebula extends, especially to the west, the general background of small stars is sharply blotted out.

3. Especially conclusive is the object (No. 7) which is shown in an article in this *Journal* on a nebulous background in Taurus, where a nebula, only partly luminous, seems to fit in a hole in the sky. Even a casual inspection shows that this nebula can be feebly seen over the entire spot where all the stars are blotted out sharply, and that the absence of stars is due to the obscuring presence of the nebula. This object is really the key to the explanation of most of the dark regions of the sky.

4. The small black spot (No. 92) shown in the photographs in this *Journal* for December, 1913, where visual observations prove the existence of a material object.

To me these are all conclusive evidence that masses of obscuring matter exist in space and are readily shown on photographs with the ordinary portrait lenses. What the nature of this matter may be is quite another thing. Slipher has shown spectroscopically that the great nebula about Rho Ophiuchi is probably not gaseous; that is, it does not have the regular spectrum of a gaseous nebula. The word "nebula," nevertheless, remains unchanged by this fact, so that we are free to speak of these objects as nebulae. For our purpose it is immaterial whether they are gaseous or non-gaseous, as we are dealing only with the question of obscuration. In the present paper it is intended to give a catalogue of some of these objects and to show further examples of obscuration and other peculiarities, and to try to emphasize the fact that they are not necessarily confined to the Milky Way but are found in other parts of the sky as well; and also to bring as much evidence as possible to prove that these extra-galactic objects show that space is itself more or less luminous.

Outside of these examples, where the object is partly luminous, there are a number of others which appear to be entirely devoid of light. These are naturally best shown on the bright background of the Milky Way, against which they appear black on the photographs. . .

All those that are in the Milky Way are not necessarily devoid of light, for they appear black by contrast with the greater brightness of the Milky Way. There are numerous examples, however, which are not in the Milky Way and which are perhaps entirely devoid of light. It would seem that such a body would be lost in the blackness of space, but they are visible as black objects against space itself. I have previously explained this anomaly by suggesting that space is probably filled with a feeble light which forms a slightly luminous background for these dark bodies. Further investigations have fully convinced me that this is actually the explanation of the phenomenon, for there is no evidence of an ordinary nebulous background in these cases. Furthermore, this feeble illumination is widespread and undoubtedly universal (so far, at least, as our stellar universe is concerned), for these dark objects are found in opposite parts of the sky, where there are few stars, and away from any possible brighter background. . . .

In previous papers I have dealt mainly with the larger dark masses and occulting nebulosities. The smaller ones that are now treated of are perhaps more interesting in a way than the larger ones. They are more definite and in a sense more clearly show the effect of obscuration of the smaller stars.

The small scale of the portrait lens accentuates the blackness and definiteness of these objects. This is a valuable asset in such a lens; it draws attention to peculiarities which might be lost by diffusion with a more powerful telescope. They are worthy of a careful study, however, with some of the large photographic reflectors. This has already been done, as I have stated, in the case of the black spot (No. 86) in *alpha*=17^{h}55^m, *delta*= -28°, by Dr. H. D. Curtis with the 36-inch Crossley re-

Edward Emerson Barnard died February 6, 1923, at the age of 66. At the time of his death he was working on an Atlas of the Milky Way, since published by the Carnegie Institution, to which his investigation of dark nebulae was incidental. Another of his outstanding contributions to astronomy was his discovery of the fifth satellite of Jupiter, September 9, 1892.

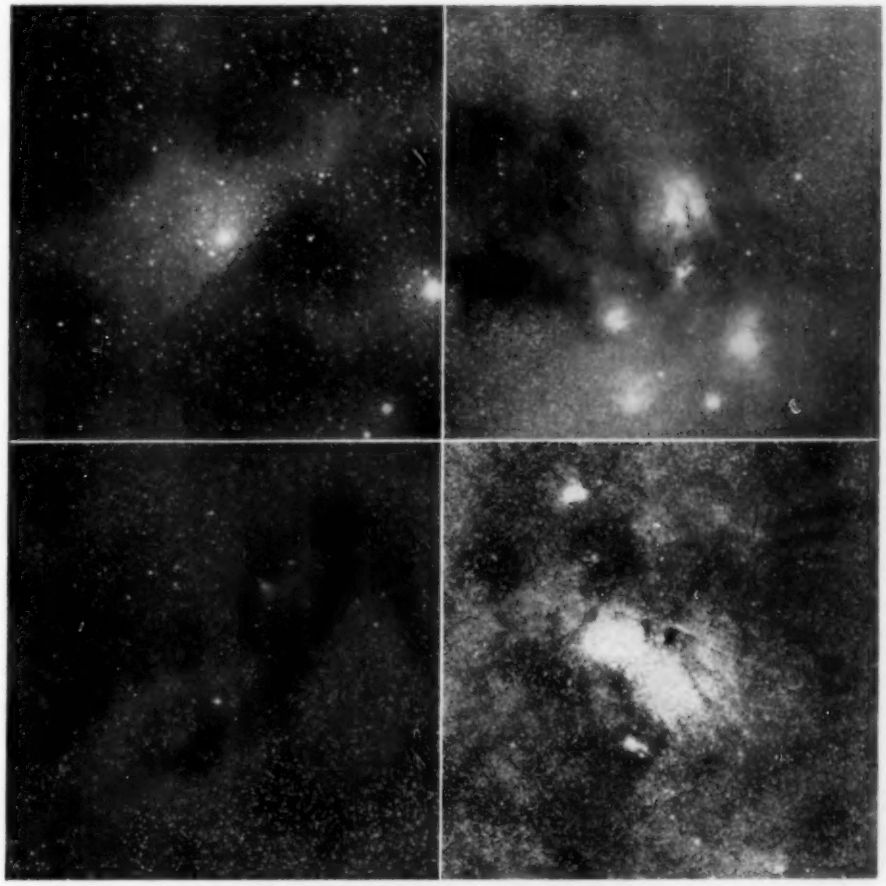
flector of the Lick Observatory. I am sure that some of the objects shown in the present photgraphs will give very interesting results when similarly investigated.

There are two regions which can be reached from the northern hemisphere that are specially rich in these dark markings: (1) the region immediately north of Theta Ophiuchi; (2) the region of the great star-cloud in Scutum near the cluster M 11. There are other regions in which black markings occur, but these two contain the most striking ones, striking for their smallness and peculiarities.

Some of the dark objects in the remarkable region north of Theta Ophiuchi are so strange in their forms that we would find it difficult to match them with similar forms among the real nebulae. This in itself would almost discourage the supposition that they are dark nebulae, and one would rather seek some other explanation for them. In other parts of the sky, however, there seems to be no need of hesitation in accepting them as real, obscuring masses, most probably dark nebulae.

Perhaps one of the finest of the large dark regions (No. 78) lies several degrees southeast of Theta Ophiuchi. It is a large, irregular, dark spot some 3° in diameter and less definite on the eastern side. There is considerable detail in it of a more or less nebulous character. This is specially evident near the bright star C.D. -26°12152 ($6^{M}.2$). Westward from this region a broken dark lane extends for about 5° to what I have called the "sink hole," because of its peculiar form and outlines. This sink hole (No. 59) is full of rich detail. Similar structural detail shows at frequent intervals along the broken lane (which is about ¾° wide) to its origin in the larger dark region southeast of Theta Ophiuchi. Splendid half-tone reproductions of this remarkable region have been published in *Popular Astronomy*.

The bright nebulae seldom show extraordinary forms. Some of them, however, exhibit structural details and general forms that are very remarkable and that sometimes are very beautiful, such as the zigzag, streaky, or "lace" nebula in Cygnus, the great nebula of Orion, and many of the planetary nebulae. It is possible then that the objects north of Theta Ophiuchi are, after all, only exceptions to the general run of nebulous forms and are similar to such objects as those in Cygnus and elsewhere among the bright nebulae.



NEBULAE BLOTTING OUT STARS

These four photographs seemed to Dr. Barnard conclusive proof that the dark masses of matter are between us and the stars, cutting off their light from us.

A peculiarity of the dark markings in the star-cloud in Scutum is that some of the well-defined spots are uniformly gray, while others are either entirely black or have much blacker, well-defined spaces in them. In nearly every case their outlines are very definite and few have stars in them. . . .

One remarkable thing in this visual investigation is the conspicuousness of the B.D. stars everywhere, while on the photographs they are difficult to make out. Evidently the sky comes up luminous on the photographs from the myriads of small stars not seen in the telescope. It is this general effect of unseen stars which do not show individually, either in the telescope or on the photograph, that helps to round out the great star-cloud. Doubtless there is not a star on the plate that cannot be seen in the large telescope, but I am not sure of this. It is mainly the light from unseen stars that makes the white background of the photographs against which the dark markings show so conspicuously. . . .

I did not at first believe in these dark obscuring masses. The proof was not conclusive. The increase of evidence, however, from my own photographs convinced me later, especially after investigating some of them visually, that many of these markings were not simply due to an actual want of stars, but were really obscuring bodies nearer to us than the distant stars. In this way it has fallen to my lot to prove this fact. I think there is sufficient proof now to make this certain. For some years I have tried to secure long-exposure photographs of as many of these bodies as possible. This has resulted in the location of a considerable number of them in different parts of the sky. Their apparent preference for the bright regions of the Milky Way is obviously due to the fact that they are more readily shown with a bright background. They are, however, not strictly confined to the Milky Way.

Among the first to look upon these dark places as real matter was Mr. A. C. Ranyard, whose lamentable death oc-

curred December 14, 1894. A short time previous to his death he gave a series of papers on the Milky Way and the nebulae, in *Knowledge*, of which magazine he was editor. In speaking of the dark lane south and east of Theta Ophiuchi on a Lick photograph of mine which he reproduced, he says: "The dark vacant areas or channels running north and south of the bright star (Theta Ophiuchi) at the center. . . . seem to me to be undoubtedly dark structure, or obscuring masses in space, which cut out the light from the nebulous or stellar region behind them."

There is a list of starless fields given in Appendix I of Webb's Celestial Objects, taken from the Cape observations of Sir John Herschel. These, however, are quite different from the ones I have been dealing with and are in most cases perhaps only real vacancies among the stars.

For some time I have hoped to make a catalogue of the dark markings shown on my photographs of the sky. The exact location of these objects is desirable so that their study with powerful photographic telescopes may be possible. There seems to be no question that some of them are real objects which are either entirely devoid of light or so feebly luminous when seen against the Milky Way as to appear black. As mere curiosities of the sky alone their cataloguing would be desirable, but as real opaque objects between us and the more distant stars their exact location would seem to be important. Their study with the present means of research will be of the highest interest. With this idea in view I have collected a number of these objects shown on my negatives to form the following catalogue. . . .

Science News Letter, February 4, 1933

PSYCHOLOGY

Women Quicker but Men Better at Prolonged Thought

WOMEN are superior to men in those mental tasks which require attention to details and a quick adaptation to a rapidly changing situation. But men are superior where quick responses are not so important as a grasp of the problem as a whole—where it is necessary to hold the attention for a prolonged period in order to carry a thing through to its logical conclusion.

These sex differences were observed in the psychological laboratories of Indiana University, Bloomington, by Dr. Hanna M. Book, who reported her findings in the *Journal of Social Psychology*.

In a test such as that of comparing two parallel columns of figures, where each item is quickly finished and one must go on to the next, women were found to excel. Men were better on maze tracing where the whole pattern must be kept in mind until a solution is found.

After a nerve fiber has been excited by any stimulus such as those constantly occurring during mental work, there follows a brief period during which the nerve fiber is inactive and cannot respond to further excitement. This refractory or inexcitable or non-irritable period is extremely short, measured in mere thousandths of a second, and is very difficult to determine. So far sex differences, if any, have not been noted. But Dr. Book explains the sex differences in mental activity she has observed as being possibly a result of such sex differences in the refractory period.

Women, she said, probably have shorter refractory periods. Therefore, their nerves transmit a greater number of impulses per unit of time, which, being physiologically a more intense stimulus, would account for their ability to respond quickly to more details and to rapid changes in environment. Men have longer refractory periods and therefore fewer impulses per unit of time, which would account for a slow, massive, deliberative sort of thinking in men.

"In general, if the task is fractional, that is divided up into parts, the women are better; if, however, the task is continuous, the men are superior," Dr. Book said.

Science News Letter, January 28, 1933

New knowledge of the Bacchic mysteries is gained by study of a statue base of the second century A.D., which once supported a statue of a priestess of the Dionysian cult and which bears the names of about 400 initiates who dedicated the monument to her.

GENERAL SCIENCE

Foundations Alter Support of Researches

AMERICAN foundations continued their support of research during 1931 despite economic conditions, it appears from a report issued by the Twentieth Century Fund.

Although the total of grants for research was cut more than two million dollars from 1930 to 1931, this reduction represented less than 19 per cent. of nearly thirteen millions which were given out in 1930. The type of research aided changed considerably, however, reflecting a change of interests during the year. Researchers in general education, international relations and aesthetics were reduced 78 per cent., 64 per cent., and 73 per cent. respectively; while research in social welfare was increased 205 per cent., research in government increased 263 per cent., and research in agriculture and forestry increased 264 per cent.

Other less extreme instances in which funds were diverted to channels aiding the present situation more directly are shown by the following increases and decreases in grants for research: Physical sciences decreased 48 per cent., engineering reduced 12 per cent., social sciences increased 21 per cent., and humanities decreased 28 per cent. Research in economics was increased 49 per cent.

Medical research received more aid from foundations in 1931 than in 1930, gaining 40 per cent., although medical education suffered a loss of more than thirteen million dollars.

Over $54,000,000 Given

The total of the grants covered in the report of the Twentieth Century Fund amounted to fifty-four and a half millions of dollars, of which by far the greatest proportion went for aid in education. The wide variety of activities to which money has ben donated, the report said, range all the way from cave dwellers' art and the causes of pessimism in the Middle Ages to the preserving of game birds, maintenance of undertaking parlors and research into ventilation, comfort stations and interstellar complications of modern times. The decrease in the total below the amount granted in 1930 was about 24 per cent.

Science News Letter, February 4, 1933

ENGINEERING-ECONOMICS

Specialists in Three Fields Would Rule Technologic State

There Are No Business Men Who Drive for Profits In Plan Developed by Prophets of Technocracy

This is the second article of a series presented to illuminate the backgrounds and objectives of the movement that has found expression in the discussion of Technocracy. The material is given as information and news, not as our opinion or with our endorsement. The next article will tell how the technologic state would operate without stocks, bonds or debts.

RESOURCE engineers, production engineers and production economists would be the triumvirate of kinds of technicians that would rule the economic life of the nation under the "practicable soviet of technicians" visualized by Thorstein Veblen over a decade ago. The ideas of this radical social philosopher are credited with leading to the technocracy movement.

Allocation of natural resources in power, equipment and materials, "for which there has been substantially no provision under the old order" and also the country's transportation and goods distribution systems would be under the same control, according to the Veblen plan which is outlined in his book, "The Engineers and the Price System." Veblen wrote:

"The central directorate will apparently take the shape of a loosely tripartite executive council, with power to act in matters of industrial administration; the council to include technicians whose qualifications enable them to be called Resource Engineers, together with similarly competent spokesmen of the transportation system and of the distributive traffic in finished products and services. With a view to efficiency and expedition, the executive council will presumably not be a numerous body; although its staff of intelligence and advice may be expected to be fairly large, and it will be guided by current consultation with the accredited spokesmen (deputies, commissioners, executives, or whatever they may be called) of the several main subdivisions of productive industry, transportation, and distributive traffic.

End to Unemployment Seen

"Armed with these powers and working in due consultation with a sufficient ramification of subcenters and local councils, this industrial directorate should be in a position to avoid virtually all unemployment of serviceable equipment and man power on the one hand, and all local or seasonal scarcity on the other hand. The main line of duties indicated by the character of the work incumbent on the directorate, as well as the main line of qualifications in its personnel, both executive and advisory, is such as will call for the services of Production Engineers, to use a term which is coming into use. But it is also evident that in its continued work of planning and advisement the directorate will require the services of an appreciable number of consulting economists; men who are qualified to be called Production Economists.

"The profession now includes men with the requisite qualifications, although it cannot be said that the gild of economists is made up of such men in the main. Quite blamelessly, the economists have, by tradition and by force of commercial pressure, habitually gone in for a theoretical inquiry into the ways and means of salesmanship, financial traffic, and the distribution of income and property, rather than a study of the industrial system considered as a ways and means of producing goods and services. Yet there now are, after all, especially among the younger generation, an appreciable number, perhaps an adequate number, of economists who have learned that 'business' is not 'industry' and that investment is not production. And here as always, the best is good enough, perforce."

The place of the consulting economist or production economist in the Veblen plan is analogous to the part which legal counsel now plays in the maneuvers of diplomatists and statesmen and he described them as something in the way of industrial statesmen of the new order.

Possibility of Warfare

Explaining the need of the production economists, Veblen said that "the technical training that goes to make a resource engineer, or a production engineer, or indeed a competent industrial expert in any line of specialization, is not of a kind to give him the requisite sure and facile insight into the play of economic forces at large; and as a matter of notorious fact, very few of the technicians have gone at all far afield to acquaint themselves with anything more to the point in this connection than the half-forgotten commonplaces of the old order."

Although repeatedly declaring rule by technicians to be remote, Veblen did not overlook the possibility of warfare between the technicians and the present control of industry.

The powers and duties of the incoming directorate will be of a technological nature, he explained, inasmuch as the purpose of its coming into control is the care of the community's material wel-

fare by a more competent management of the country's industrial system. And he added:

"Even in the unexpected event that the contemplated overturn should, in the beginning, meet with armed opposition from the partisans of the old order, it will still be true that the duties of the incoming directorate will be of a technological character, in the main; inasmuch as warlike operations are also now substantially a matter of technology, both in the immediate conduct of hostilities and in the still more urgent work of material support and supply." Business men and those contaminated with the businesslike viewpoint would be shunned and excluded from the new order of the rule by technicians, just as royalists are excluded from positions of control in soviet Russia today.

This is a fundamental part of the "soviet of technicians" outlined in 1919 by Veblen.

Salesmanship Not Wanted

"To avoid persistent confusion and prospective defeat," Veblen wrote, "it will be necessary to exclude from all positions of trust and executive responsibility all persons who have been trained for business or who have had experience in business undertakings of the larger sort. This will apply generally, throughout the administrative scheme, although it will apply more imperatively as regards the responsible personnel of the directorate, central and subordinate, together with their staff of intelligence and advice, wherever judgment and insight are essential. What is wanted is training in the ways and means of productive industry, not in the ways and means of salesmanship and profitable investment.

"By force of habit, men trained to a businesslike view of what is right and real will be irretrievably biased against any plan of production and distribution that is not drawn in terms of commercial profit and loss and does not provide a margin of free income to go to absentee owners. The personal exceptions to the rule are apparently very few.

"But this one point is after all of relatively minor consequence. What is more to the point in the same connection is that the commercial bias induced by their training in businesslike ways of thinking leaves them incapable of anything like an effectual insight into the use of resources or the needs and aims of productive industry, in any other terms than those of commercial profit and loss. Their units and standards of valuation and accountancy are units and standards of price, and of private gain in terms of price; whereas for any scheme of productive industry which runs, not on salesmanship and earnings, but on tangible performances and tangible benefit to the community at large, the valuations and accountancy of salesmanship and earnings are misleading.

Even Good Will Useless

"With the best and most benevolent intentions, men so trained will unavoidably make their appraisals of production and their disposition of productive forces in the only practical terms with which they are familiar, the terms of commercial accountancy; which is the same as saying, the accountancy of absentee ownership and free income; all of which it is the abiding purpose of the projected plan to displace.

"For the purpose of this projected new order of production, therefore, the experienced and capable business men are at the best to be rated as well-intentioned deaf-mute blind men. Their wisest judgment and sincerest endeavors become meaningless and misguided so soon as the controlling purpose of industry shifts from the footing of profits on absentee investment to that of a serviceable output of goods."

Science News Letter, February 4, 1933

So important are ladybird beetles to California farmers, as an aid in destroying crop pests, that the University of California has asked the public to report where the beetles may be found in large numbers.

DENDROLOGY

NATURE RAMBLINGS
by Frank Thone

A Leafless Evergreen

WE ARE commonly accustomed to refer to the cone-bearing trees as "evergreens." The title does very well most of the time, for the evergreen habit is strongly characteristic of the group, which includes pines, spruces, firs, red cedars, arbor vitae and a number of other species. But there is one familiar cone-bearer that does not keep its needles all winter long as its kindred do, but drops them like the maples and oaks and hickories. This is the larch, or tamarack.

The native American tamarack is a swamp-loving tree, rarely to be found with its feet out of water. In some parts of the country it forms great forests in the flat wet lands bordering boggy lakes. In such places it is a pioneer, pushing out over the quaking bog ahead of all other trees, and assisting in the slow upbuilding of the drier land required by them. Although its native home is in boggy land, the larch does very nicely on higher ground when planted there, and enjoys some favor as an ornamental tree. For the most part, however, people seem to prefer the European larch, which forms a wider pyramid with its long, horizontal branches and slender, pendulous twigs. The cones of the European larch, also, are much larger than the tiny nubbins of the American species.

The timber of the tamarack was long held in low esteem, for it is rougher and more brittle than that of most other softwoods. But with the lumber famine that has arisen in the land as the result of our earlier greed and recklessness in sweeping off the more valuable trees, larch has found a place of its own in the American market.

Science News Letter, February 4, 1933

First Glances at New Books

Economics

ECONOMIC TENDENCIES IN THE UNITED STATES—Frederick C. Mills—*National Bureau of Economic Research,* 639 p., $5. As an essential and fundamentally important economic history of the United States from the turn of the century until the beginning of the depression, this volume, replete with figures and graphs, will go far toward answering many questions which are raised by the present furor which surrounds the word "technocracy." In a sense, this volume is the continuum report of "Recent Economic Changes in the United States," published in 1929 by the Committee on Recent Economic Changes of the Hoover Conference on Unemployment. The author, Dr. Mills, is one of the research staff of that non-profit institution which makes impartial investigation in economic, social and industrial science.

Science News Letter, February 4, 1933

Psychology-Education

AN EXPERIMENTAL STUDY OF SUPERSTITIONS AND OTHER UNFOUNDED BELIEFS AS RELATED TO CERTAIN UNITS OF GENERAL SCIENCE—Otis W. Caldwell and Gerhard E. Lundeen—*Teachers College, Columbia University,* 138 p., $1.25. Superstitions and unscientific ideas still have a great hold on high school students. General courses in science do not serve to correct these beliefs, the authors have found. In this volume they show the way to include in the science course direct instruction aimed at the more commonly accepted unfounded beliefs.

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Economics-Engineering

THE ABC OF TECHNOCRACY—Frank Arkright—*Harper,* 73 p., $1. "Based on authorized material" this brief volume adds practically nothing to the so-called explanations that have appeared in newspapers and magazines. It rants at the "price system"; insists that energy is the basis upon which this continent should be operated, calls attention to the rise of debt and variations in the purchasing power of the dollar, and calls Technocracy's one fundamental principle "that the facts involved in the functional operation of our society are metrical, in other words, the working of our great social machine is susceptible to measurements." But as for a practical plan of Technocracy, there is none. Even if the book contained correct diagnosis of our civilization's ills, there is no treatment suggested. The good old patent medicine man's trick of big names and pseudo-technicalities is employed. Figures and factual claims are given wholly without sources. Compared with Veblen, Soddy or the extensive studies in economics that have been made and published in the past few years, as its opening sentence says: "This is a disturbing book."

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Medicine

CANCER THEN AND NOW—New York City Cancer Committee—*Chemical Foundation,* 80 p., $1. This book is the outgrowth of an exhibit displayed by the Committee as part of its educational work. Various phases of the cancer problem, such as methods of treating, the parts played by physicians, nurses and hospitals, and cancer research are graphically illustrated on one page, while opposite is a discussion of that phase of the subject by an authority. As a result, much sound information is conveyed in brief space. Chief credit for the book apparently goes to Dr. John C. A. Geister, chairman of the Committee; Dr. Paul Kurt Sauer, secretary, who prepared the chart texts; and Mrs. Francis J. Rigney, publicity director of the Committee, who conceived and executed the plan of the exhibit.

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Aviation

KRONFELD ON GLIDING AND SOARING—Robert Kronfeld—*John Hamilton, London,* 379 p., 21s. Authoritatively and in considerable detail a skillful German pilot who carried the art and science of gliding to England gives the history and present status of soaring flight.

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Engineering

SYMPOSIUM ON STEEL CASTINGS—*American Society for Testing Materials and American Foundrymen's Association.* 254 p., $1.

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General Science

YEARBOOK, NO. 31, 1932—*Carnegie Institution of Washington,* 392 p., paper bound, $1; cloth bound, $1.50. The records of research contained in the Year Books of the Carnegie Institution of Washington form significant chapters in the history of American progress. The wideflung researches of this great institution are recurrently fruitful. Commenting that "between fundamental research and the incidents of day-to-day living the gap may seem extremely wide," the president, Dr. John C. Merriam says: "Once the boundaries of knowledge have been moved forward, it becomes important to know the values represented by such advance. The time has long passed when it seemed desirable to inquire whether information about the universe or ourselves could exist which would not have human value. The unity of knowledge as we now begin to conceive it indicates that ultimately everything attains its place. That which seems insignificant may finally appear among the most important influences in life. Such is, in part, the justification for a program of intensive effort devoted to advancement of knowledge in the spirit of human service."

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Engineering-Economics

LIFE IN A TECHNOCRACY, What It Might Be Like—Harold Loeb—*Viking Press,* 209 p., $1.75. This is a careful, interesting and thought-provoking addition to the literature of Utopias, carrying on the ideas of Veblen and doing some homage to Howard Scott. It is worth reading if only to disagree with it. It is not the literary product of the past few weeks since the Technocracy furor began, but was written several months ago. The author concludes ". . . . an unprejudiced examination of the capitalistic system compels an open mind to formulate a new system for providing man with goods necessary for life on earth, a system incorporating the good of capitalism and discarding the evil, a system akin to the technocracy outlined in these pages. . . ."

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